Response

-The claimed inventi n

The claimed invention is directed to the problem of how to prehydrate a water soluble polymer--without heating or the use of an organic solvating agent--so that the polymer can be added to a brine on site to produce effective rheology and fluid loss control without causing the brine to agglomerate upon exposure to the high temperatures experienced downhole.

The data in Example 1 of the referenced specification (pp. 7-8) establishes that a final brine prepared using a precursor polymer dispersion of the present invention (FLUID A) had superior properties compared to a final brine prepared using a powdered polymer solvated by tripropylene glycol (FLUID B). Since the record of the experiment in Example I is not entirely complete, Applicants are submitting the Declaration of Billy Chesser to supply the missing data. Chesser Decl., paragraphs 3-5. As explained in Example I (p. 8), the rheological properties of FLUID A did not change significantly after heat aging at 200°F and the filtration control was satisfactory before and after heat aging. In contrast, the initial yield point (YP) of FLUID B was borderline as to providing sufficient suspension properties and increased to excessive values in plastic viscosity and yield point after heat aging. The filtration control of FLUID B also was unsatisfactory upon initial preparation, as evidenced by the API Filtrate results. The reason for using a higher starch concentration in FLUID B was to improve the initial properties, but the higher starch concentration did not provide adequate improvement.

The references cited by the examiner are not directed to the problem of how to hydrate a water soluble polymer without heating or the use of an organic solvating agent to provide a final brine having effective rheology and filtration control. Because of this, it is not surprising that the references

do not teach or suggest the claimed combination, which is essential to solving the problem. **The claimed invention solves the pr blem by forming a precursor polymer dispersion--(a) from a precursor brine consisting essentially of multivalent salt(s), and (b) using a relatively large concentration of water soluble polymer or starch.**

-The failure to establish *prima facie* obviousness

The examiner has not created a case of *prima facie* obviousness of any of the pending claims over DD v. Mondshine v. House because the examiner has not pointed to a teaching or suggestion in any of these references to use a precursor brine to achieve a level of polymer prehydration effective to produce a final brine with effective rheology and fluid loss control. Even if DD's initial sodium chloride solution was considered to be a "prehydration" solution (which Applicants contest) , the examiner still has not pointed to a teaching or suggestion in the cited references that would motivate a person of ordinary skill in the art to substitute a multivalent salt for the sodium chloride in DD's initial brine. MPEP 2143.01; *In re Brouwer*, 37 U.S.P.Q.2d 1663, 1666 (Fed. Cir. 1995).

-DD

DD's goal in forming the initial sodium chloride solution is as follows:

> The technological objective of the invention is the development of a rinse and treatment liquid for deep-hole drilling which contains solid material which is distinguished by simple production, permits sealing (blocking) with low losses, can be easily removed once again by reblocking, has a high sedimentation stability, and can be used in particular in layers containing sulfate water where required densities of 1.32 g/cm^3 are of decisive importance.

DD (p.2) further explains that

> the objective is realized by the rinse and treatment liquid for deep hole drilling which contains solid material consisting of **a suspension of the most finely grained sodium chloride in a magnesium chloride solution which contains viscosity-increasing polymers and small amounts of a recrystallization inhibitor. . . . The suspensions obtained by simple precipitation of NaCl through the addition of magnesium chloride can achieve densities**

up to 1.38 g/cm^3. A further increase in density is possible by addition of a deposited (sedimented) NaCl sludge produced in a similar manner.

Id. (emphasis added). DD's objective is to produce "a suspension of the most finely grained sodium chloride in a magnesium chloride solution." The examiner has not pointed to a teaching in DD to use DD's sodium chloride solution to prehydrate DD's "viscosity-increasing polymers."

Furthermore, the use of the claimed multivalent polymers has advantages over the use of either fresh water or aqueous solutions of monovalent salts as prehydrating solutions for the polymers. When fresh water or aqueous solutions of monovalent salts, such as sodium chloride, were used to prehydrate the claimed water-soluble polymers, and those polymers were added to a final brine and the final brine subjected to heat equivalent to temperatures that might be experienced downhole, those final brines tended to agglomerate and form a highly viscous mass with unsuitable rheology and filtration control properties. Chesser Decl., ¶ 6. Without limiting the invention, it is believed that this tendency to agglomerate is due to overhydration of the polymer.

-Mondshine

Mondshine does not fill the gap left by DD. As Applicants previously pointed out, Mondshine lists calcium chloride and calcium bromide as 2 of 8 suitable salts for forming a "final brine." However, the other 6 listed salts are either potassium or sodium salts. Mondshine teaches that potassium chloride and sodium chloride are preferred salts "due to their availability and cost." Col. 2, ll. 44-46.

The examiner admits that "Mondshine teaches that all salts are known and can have the **same** effect on the drilling fluids and subsequent use of the fluids." Final action, page 3 (emphasis added). Essentially, this is an admission that Mondshine fails to teach that any advantage would be gained by choosing multivalent salts from Mondshine's list for any particular reason. The examiner clearly has

pointed to no teaching or suggestion that such a substitution would have a positive impact when used to prehydrate water soluble polymers.

The examiner apparently tries to establish the missing motivation to modify DD by arguing that "[t]he reference **does not say** that any of the other salts mentioned **are not as effective** otherwise." Final action, page 3 (emphasis added). The United States Court of Appeals for the Federal Circuit (the "Federal Circuit") recently rejected similar reasoning in determining whether a case of *prima facie* anticipation had been made. *Rowe v. Dror*, 42 USPQ2d 1550, 1555 (Fed. Cir. 1997). In *Rowe*, the Board took the position that "the Lemelson patent" anticipated a claim to a balloon angioplasty catheter. The Federal Circuit interpreted the claims as requiring "a balloon angioplasty catheter capable of expanding radially and exerting pressure on the plaque-encrusted walls of a surrounding blood vessel." *Id.* The Federal Circuit concluded that "[a]bout the most that can be said for the Lemelson patent is that **it does not explicitly describe anything inconsistent with angioplasty procedures. However, this negative pregnant is not enough to show anticipation**." *Id.* (emphasis added).

Mondshine's failure to describe anything inconsistent with making the required substitution --particularly in view of Mondshine's teaching that sodium and potassium chloride are preferred salts-- is not a teaching or suggestion **to use multivalent salts to form the precursor polymer dispersion, as required by the claims**. In fact, Mondshine's choice of potassium and sodium chloride as preferred salts for his brine would teach away from choosing calcium salts from Mondshine's list of suitable salts to form that brine. This is evidence of non-obviousness. *In re Hedges*, 228 U.S.P.Q. 685, 687 (Fed. Cir. 1986), quoting *W. L. Gore & Assoc. v. Garlock, Inc.*, 220 U.S.P.Q.303, 312 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

The examiner has failed to point to any teaching or suggestion in Mondshine that any **advantage** could be gained by modifying DD to substitute a multivalent salt for the monovalent salt in DD's initial brine. The examiner certainly has not pointed to any teaching or suggestion in any of the cited references that the combined use of a multivalent salt and a relatively large concentration of water-soluble polymer would result in a dispersion which, when added to a final multivalent brine, would produce effective rheology and filtration control. Therefore, the examiner has failed to meet his burden to show reasons why "the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457-1459 (Fed. Cir. 1998). Where the examiner fails to provide an appropriate explanation, the Federal Circuit will infer that hindsight reconstruction occurred. *Id.*

The examiner appears to contend that that it would have been obvious to a person of ordinary skill in the art to substitute an aqueous solution of each of the compositions described in Mondshine or House for DD's initial sodium chloride solution. However, the examiner has failed to point to a teaching or suggestion that the use of a multivalent brine is a result effective variable. The MPEP provides that "a particular parameter must first be recognized as a **result-effective variable, i.e., a variable which achieves a recognized result**, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." MPEP 2144.05 (2100-120). The discovery of an optimum value of a variable in a known process normally is an obvious variation. However, the CCPA recognizes that there are exceptions to this rule. One exception is where "the parameter optimized was not recognized to be a result-effective variable." *In re Antonie*, 559 F.2d 618, 620, 195 U.S.P.Q. 6, 8 (C.C.P.A. 1977); MPEP 2144.05 (2100-120). In *Antonie*,

the PTO argued that "it would always be obvious for one of ordinary skill in the art to try varying every parameter of a system in order to optimize the effectiveness of the system even if there is no evidence in the record that the prior art recognized [that] that particular parameter affected the result." *Id.* The court disagreed, explaining that "**[d]isregard for the unobviousness of the results of 'obvious to try' experiments disregards the 'invention as a whole' concept of § 103.**" *Id.*

-House

The examiner attempts to fill the gap left by DD and Mondshine with the teachings of House. However, the examiner has not pointed to any teaching in House that would **motivate a person of ordinary skill in the art to substitute a brine comprising an aqueous solution of a first salt consisting essentially of cations of a multivalent alkaline earth metal for DD's monovalent salt solution, or to use that solution to prehydrate a relatively large concentration of water soluble polymers**.

The examiner points to column 14 of House as teaching the addition of polymers to brines containing multivalent salts, and subsequently adding $CaCO_3$ to the solution. The examiner contends that "[t]he hydration does not occur until [the] after the $CaCO_3$ is added." Final action, p. 3. Apparently the examiner contends that the claimed feature of "mixing of a sufficient quantity of said precursor polymer dispersion with a final brine" corresponds to House's addition of $CaCO_3$ to his initial brine solution.

The "$CaCO_3$" referred to by the examiner is described as a "solid, particulate inert filler." Col. 5, ll. 19. Both the claimed precursor polymer dispersion and the claimed final brine are **aqueous** solutions of multivalent salts. Where necessary, the claims have been amended to make this clear.

In fact, what House actually teaches is

a polymeric composition comprising a particulate, organic polymer which is water soluble or water dispersible and upon solubilization or dispersion in an aqueous medium increases the viscosity or decreases the fluid loss, **a solvating agent**, and a diluting agent which is a non-solvating agent for the polymer. **The solvating agent is a water miscible, polar organic liquid which when uniformly mixed, as by spatulating, with the polymer in a weight ratio of polymer to solvating agent of 1:2 will produce a viscous to semi-solid mixture with no free liquid (solvating agent) present after the mixture sets for approximately one week, at ambient temperature, in a sealed container**.

Col. 1, ll. 52-65 (emphasis added). House achieves hydration of his polymers in his heavy brines by using this solvating agent, which is said to "exhibit[] a swelling effect on the polymer." House, col. 2, ll. 61-65. *See also* House, col. 6, ll. 21-22; Table 1; col. 7, ll. 7-8; col. 13, ll. 61-64, etc.

The examiner cannot rely on House's addition of a solid, particulate $CaCO_3$ filler to his brine solution as a teaching or suggestion to add a first aqueous solution of a multivalent salt having a first density to a final aqueous solution of a multivalent salt having a final density in order to sufficiently hydrate House's polymers to provide for effective rheology and/or filtration control properties under downhole conditions. The examiner has not pointed to a teaching or suggestion in House that the House could effectively hydrate his polymers in the absence of a solvating agent and/or a solid particulate filler as a dispersant.

If the examiner attempts to meet his burden to establish motivation by contending that something is "well known" in the art, the Applicants demand that the examiner supply a rebuttal affidavit, 37 C.F.R. § 1.107 (b), or cite a reference to support such a contention. MPEP 706.02(a) and 2144.03.

CONCLUSION

Applicants submit that the claims are allowable even if the examiner refuses to enter the amendments submitted. Since the amendments are not necessary in order to obtain allowance of the claims, but do clarify the invention, Applicants respectfully request that the amendments be entered

and the claims allowed. The Commissioner is authorized to charge any fees required by this paper to Deposit Account No. 02-0429 (154-9245).

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this paper, along with any referred to as being attached or enclosed, is being forwarded to _____, Assistant Commissioner for Patents, Washington, D.C. 20231, via the United States Postal Service, First Class mail, Postage Prepaid, on Feb. 1, 1999.